

Using the Managerial Enterprise Structure Stakeholders (MESS) Model to examine the effects of organisational politics and structure upon the cost of Information Systems development

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ABSTRACT

As organisations are driven to maintain profitability in a global market, Information Systems (IS) must deliver projects that return on their investment. Managers are faced with greater complexity in their rapidly changing business environments. The Managerial Enterprise Structure Stakeholders (MESS) model developed in this paper allows the user to build a rich picture to show the relationships between information politics, organisational structure, managerial control, communication methods, and the cost of systems development. The MESS model aims to improve management of key projects in large organisations. The paper provides an overview of the model and describes how the model was refined. This was done through action research and field observations in over 12 high impact projects in a variety of large organisations in the public and the private sector. The action research shows why the MESS model is useful to project managers.

Keywords: Systems thinking, organisational politics, centralisation

INTRODUCTION

We need systematic thinking in Information Systems management in order to increase the rate of success of development projects and/ or reduce their cost. One of the important factors determining this cost or success is the way in which the projects are governed. As well, the interplay between the people in a project – the politics - can markedly influence how well the project meets the classic three criteria for success: on time, on budget, and to specification.

There is a need to assist managers in systems development. A manager of a project needs the right tools to manage information politics, so that we have fewer project failures (Davenport *et al*, 1992) and more business solutions. The manager must understand the relationship between project structure, and its political implications, with managerial controls and hence cost of development (Strassmann, 1995). By gaining an understanding of the dynamics between these elements, managers can make more informed choices in decisions that impact the systems development process.

A 'fit' of the project within the framework of organisational politics is one the most important contributions to project success, yet it is often overlooked. The effect of politics upon conflict between users and the success of projects is well-established (Hart, 1997, Warne, 1997). Whether an IS organisation is more under a monarchy or federalism model determines the policy and procedures employed in the management of the IS function (Davenport, 1997). The exercise of power and control, as it is developed from the Chief Executive officer and Board of directors down, is known as the vertical centralisation dimension of organisational structure (Dv) (Mintzberg, 1989).

Organisations can be devolved horizontally as well. They can use regional offices that replicate central office functions; such as personnel or IT support. Such horizontal decentralisation (Dh). can influence the cost or success of systems development. For example, Kirwin & Mack (1997) examine the Total Cost of Ownership (TCO) of End-User (EU) models and find that this decentralisation led to costs that were much higher than more centralised models. Similarly, Bell & Wood-Harper (1998) argue that organisations

failing to assess such issues would continue their "litany of disasters" (p3) from a systems development project perspective.

As Bell and Wood-Harper (1998) and Davenport(1997) indicate, different political ecology yield different organisational structures, such as, Monarchy versus federalism. Different political ecologies warrant different forms of managerial control. For example, under a Monarchy decision making is vested in an individual, whereas under a federal model decision making is vested in a group structure. Accordingly, these structures in turn must impact cost.

Normative modelling of information politics and organisational structural mechanisms has been described (Davenport, 1997; Pfeffer, 1992; Strassmann, 1995); usually with a simple use of examples that have not been tested empirically to substantiate their position. We need to develop these approaches in a way that can be empirically substantiated. Moreover, what we do not know is the extent to which the choice of appropriate managerial control, such as using decentralised development teams, influences the costs of development of a system or how much the choice of co-ordination mechanism influences the success of systems (Davenport, 1997; King, 1983a; Mintzberg, 1989).

OVERVIEW OF THE MODEL

We proposed a model showing the extent of the relationship between the governance and political factors of system development and their cost. In particular, we sought to build upon the works of King (1983a, 1983b), Kraemer & King (1986a, 1986b, 1986c; 1987, 1988), Lewis (1990), and Mintzberg (1979, 1989).

The Managerial Enterprise Structural Systems (MESS) Model was developed to address these needs. The principal components of the model are:

Managerial
Enterprise
Structure
Stakeholders

In other words, we exert *managerial* control over our *enterprises* through *structural* mechanisms, which if done effectively address each *stakeholder's* needs and political interests.

It is necessary to determine an appropriate level of managerial control. One of the features of the MESS model is choosing the right structural mechanism to achieve the desired level of control. This level of control then impacts the structural mechanism employed, which in turn impacts the cost of the chosen mechanism. The implication is that if an inappropriate control is put into place, the cost of the project is likely to be greater than if more appropriate controls were used.

The basis of the MESS model is:

if

PPC denotes a measure of political power and complexity

Dv denotes a measure of vertical decentralisation

Dh denotes a measure of horizontal decentralisation

Cost denotes the dollar cost per head of a project

then

Cost is a function of (PPC, Dv, Dh).

Our research objective was to determine the nature of the relationship between cost and the factors reflecting centralisation and politics. It is proposed that the cost of project is influenced by organisation structure in which a project sits, information politics, and the managerial controls employed to manage a project.

METHOD

The Human Activity (or Stakeholder Influence Diagrams) Modelling Technique (Checkland and Scholes, 1991, as an example) was used to understand the relationship between stakeholders in a number of field observation collected from project in a large public sector organisation.

We examined the relationships between stakeholder in order to understand the way political influence is exercised in each situation. We also examined the differences between the governance of the projects, the

way the project team members interacted, and the proximity of stakeholders and projects staff both geographically and organisationally.

The research program is outlined in Table 1. The research started with a 'theory building' phase and then went into a 'theory testing' phase.

Model Development Phase	Analytic Interpretive Research
Data Collection	Field Observation Phase 1
Synthesis of Results and Model refinement phase	Analysis of Results of initial cases
Confirmation of Model Predictions	Field Observation Phase2

Table 1. Research Phases

SAMPLE OF STUDIES

The projects chosen varied in terms of their size, as measured by the number of person years of effort. This variation allowed an examination of the applicability of the MESS model to small and larger scale projects. They also varied in political complexity, as defined by the number and relative influence of the stakeholders in a business area. We collected data from field observations in two other organisations. The aim was to confirm that the model is still valid, when varying the size and sector of organisations to which this model is applied.

The projects used in the first action research case were drawn from a large organisation (over 15,000 staff) in the public sector that was widely geographically dispersed in its location of offices and hence in its IS architectures. The projects involved representation from both IS management and user management. We drew data from project management reports such as Advisability studies, Project description reports, Project estimate reports, Project expenditure progress reports, Project PERT and Gantt charts and Organisation IS Plans.

More importantly, we used the personal observations of the first author who was working within the organisation at that time), and comments from his colleagues, throughout the course of the projects. Observations were made of how projects were managed, users satisfied, and costs controlled.

The second organisation was a medium sized, public sector agency, with approximately 2000 staff responsible for government programs. Because of cabinet policy, most work was outsourced to private sector providers. The organisation had a regional and functional matrix structure, with only two tiers of management between the CEO and operative staff.

The third organisation was a large private sector company in the transport industry, with approximately 20 000 staff, providing travel services globally. The organisation had three tiers of management, and one supervisory level, to which operative staff report. This organisation had a complex structure, being comprised of a group of regional, national and international companies.

ANALYSIS

Whilst it is not common practice to use statistical analysis in action research, the following analysis was done to lend some empirical support to interpretivist claims of the model developed. The model is seeking to draw together established concepts in measuring political complexity and decentralisation. This has not been done before and hence the need for analytical work to build and refine the work. Essentially the model is concerned with relationships between a number of variables. Once the general relationship has been established, a more empirical approach (as suggested by Galliers 1994) is required to extend the applicability of the model. Accordingly, the following analyses were used.

(a) Phase 1

In phase one of the study data were collected from eight cases collected in the first organisation with the view to testing the dependence between Dv, Dh, PPC, and Cost. These data were ratings (from 1 = very low to 5 = very high) of the vertical and horizontal decentralisation of the organisation as it took systems

through the stages of development: Systems Definition, Systems Analysis, Systems Design, Applications Design, Database Administration, Documentation, and User Training.

We used a rating of 1 = very low to 5 = very high to measure the Political Power and Complexity (PPC) score. The assessment of this rating was based upon a very detailed examination of the influence diagrams of the 'players' in the various systems development phases (There is insufficient space here to give the diagrams). We used the diagrams to determine two components of the PPC score: directness of influence (with immediate links receiving more weight than indirect links) and number of avenues of influence (as some stakeholders could exert power directly through the chain of command and indirectly, perhaps, through informal networks of various kinds. As well, we assessed the interest of the stakeholders in the result of the project. PPC was determined from our judgement of the 'clout'; arising from the combination of directness, avenues, and interest.

We estimated the cost of each project from the its official records. These costs were divided by the average number of staff assigned to the project at each stage. This cost per head was used as the output ('dependent') variable, with the ratio used to control for the effects of project size.

We also estimated the 'impact' of each project after its implementation. This impact scale was alos from very low to very high. The rating was assigned following discussion with key users and senior managers. It was our general assessment taking their comments into account.

This observation was treated as a repeated measures (stages) over fixed effects (structure) design. Hence there were three sets of observations (PPC, Dh and Dv) over seven stages for eight organisations. These 56 observations were of sufficient power for valid analysis using chi-square with six degrees of freedom at a Type 1 error rate of 5% (Cohen, 1992).

(b) Phase 2

In phase 2 we established the predicative capability of the model by comparing expected against observed findings for the cost of the projects in the second and third organizations. The scales were as for Phase 1. These two tables were then subjected to a chi-squared test for goodness of fit.

FINDINGS

The first stage found support for all the key components of the model, establishing clearly the relationship between Cost, Dv, Dh, and PPC.

$$\text{Cost} = f(\text{PPC}^2, \text{Dv}^2, -\text{Dh}).$$

That is, cost was reduced if political power of senior stakeholders was high but too much power led to more cost, if vertical centralisation was high but then cost increased, and if horizontal decentralisation was low.

In essence, putting powerful people onto a project managed close to the top did reduce costs but only to a point. Too much power or direct control could lead to political fights, delay, and hence costs.

CONCLUSION

Good human activity modelling was invaluable in building a rich picture of the underlying political environment. This laid the foundation for measuring:

- Dv, by revealing the level of management and avenues of influence
- Dh and PPC, by seeing how power flowed to IS professionals or end-users.

Hart (1997) is right, politics can interfere with successful systems development. The results of our studies provide some quantitative support for his proposal.

The influence diagrams and MESS scores for Dv, Dh and PPC can help build the tapestry from which we can start to understand, and quantify how information politics impacts systems development projects. From this, we can put effective controls in to place to manage a project.

The sample above demonstrates a pragmatic way in which methods are synthesised to better manage projects. By using the MESS Model a manager should be able to:

- (a) Categorise the situational context in which they exist, using measures of Dv, Dh, and PPC.
- (b) Choose the managerial Control mechanism that is appropriate.
- (c) Select which system development approaches and tools to rely upon.
- (d) Assess which method of communication best supports the situation

This model has now been applied successfully in six large organisations in both public and private sector. The model is being incorporated into systems development methodology of large global financial service provider and into the methodology employed by one the largest solution centres of Global outsourced solution provider.

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